IEC 62595-1-2

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Withdrawn

LCD backlight unit –
Part 1-2: Terminology and letter symbols

Écran LCD à rétro-éclairage –
Partie 1-2: Terminologie et symboles littéraux

IEC 62595-1-2:2011

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LCD BACKLIGHT UNIT –

Part 1-2: Terminology and letter symbols

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International Standard IEC 62595-1-2 has been prepared by IEC technical committee 110: Flat panel display devices.

The text of this standard is based on the following documents:

CDV	Report on voting
110/275/CDV	110/323/RVC

Full information on the voting for the approval on this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 62595 series, under the general title *LCD Backlight Unit*, can be found on the IEC website.

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LCD BACKLIGHT UNIT –

Part 1-2: Terminology and letter symbols

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1 Scope

This part of IEC 62595 gives preferred terms, their definitions and symbols for backlight unit (BLU) and related display panel lighting systems including frontlight; with the object of using the same terminology when publications are prepared in different countries.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts), *International Electrotechnical Vocabulary* (available at <http://www.electropedia.org>)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-845:1987[1] and the following apply.

3.1 Classification of terms

Terms for backlight units (BLUs) are classified as follows:

a) fundamental terms;

b) terms related to passive optical components;

c) terms related to light sources ;

d) terms related to light source drivers;

e) terms related to frontlight unit;

f) terms related to performances and specifications ;

g) terms related to backlight dimming.

The following definitions are applied for international standardization of the backlight units.

3.2 Fundamental terms

3.2.1
backlight unit
BLU
illumination unit (arbitrary shape) with unique optical characteristics that is set at the rear of a transmissive or transflective display panel for the purpose of image recognition on the panel

Note 1 to entry: For an example, see Figure A.1.

[1] Identical to CIE 17.4.

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3.2.2
edge-lit backlight unit
side-lit backlight unit
edge-light backlight unit
side-light backlight unit
backlight unit in which an optically transparent media (light-guide plate) is used in proximity with the light source for introducing the light from the side surface of the media

Note 1 to entry: For an example, see Figure A.2.

3.2.3
direct-lit backlight unit
direct-view backlight unit
backlight unit in which a light chamber is used in combination with light sources that are mounted inside the chamber to illuminate a transmissive LCD panel mounted on the chamber for modulating spatially the displayed two-dimensional information on the panel for the purpose of image recognition

Note 1 to entry: For an example, see Figure A.3.

3.2.4
side-driven direct-lit backlight unit
backlight unit in which a light chamber is used in combination with light sources that are mounted on the inner sides of the chamber to illuminate a panel mounted on the chamber for modulating spatially the displayed two-dimensional information on the panel for the purpose of image recognition

3.2.5
static backlight unit
single or integrated flat illumination system that operates with direct or alternative current and possesses a unique optical characteristic

3.2.6
dynamic backlight unit
single or integrated illumination units that possess a unique electro-optical and spatial characteristics which change with the local picture contents of the display panel

3.2.7
blinking backlight unit
backlight unit that is intentionally, usually regularly or periodically, switched on and off for synchronically illuminating a display panel

3.2.8
scanning backlight unit
backlight unit that is divided spatially into few line blocks and regularly or periodically switched on and off block by block for synchronous illumination of the display panel

3.2.9
spatio-temporal backlight unit
backlight unit that is divided spatially into few horizontal blocks and regularly or periodically switched on and off from top to bottom under a time chart for illuminating or flashing red, green, or blue light in synchronization with a field-sequential colour display

3.2.10
field alternative backlight unit
backlight unit that includes a single light-guide plate (LGP) with distinctive upper and lower light sources or a plate that is spatially divided into two upper and lower plates for cooperation with a display panel for illuminating or flashing alternatively the panel with respect to displayed half image by the upper or lower part of the panel

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3.2.11
single-side emission backlight unit
backlight unit that emits light from a single side (front or rear) for illuminating a single display panel

3.2.12
double-side emission backlight unit
backlight unit that emits light from both front and rear for illuminating two display panels

3.2.13
segmented backlight unit
backlight unit that is block-wised or segmented two-dimensionally to be synchronized with a display panel for illuminating individually each block or segment of the display

3.2.14
quasi-monochromatic backlight unit
backlight unit that uses only quasi-monochromatic light source for illuminating transmissive passive display panel

3.2.15
multi-colour backlight unit
backlight unit that consists of few primaries or quasi-monochromatic light sources for illuminating a display that is used for wide colour gamut display of printer, professional design monitor or field alternative wide colour gamut display panel

3.2.16
mobility enhanced backlight unit
backlight unit that employs light materials and few optical components for the sake of enhancing lightness for mobility

3.2.17
corner driven backlight unit
edge-lit backlight unit in which the light is driven from the corner of a rectangular light-guide plate using single or few light sources

3.2.18
stack backlight unit
backlight unit in which more than a single light control media or light-guide plate is used in stack form in the structure for light controlling

3.2.19
colour reproduction backlight unit
backlight unit that uses primaries for the sake of colour production on a display panel

3.2.20
RG-white backlight unit
backlight unit that uses RG-white LEDs as light sources

3.2.21
RGW backlight unit
backlight unit that uses distinct red, green and pseudo-white LEDs as light sources

3.2.22
three primaries (R,G,B) backlight unit
backlight unit that uses three primary colours of red, green, and blue quasi-monochromatic LEDs as light sources

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3.2.23
six primaries (R_1,G_1,B_1,R_2,G_2,B_2) backlight unit
backlight unit employing two groups of red, green and blue light sources for illuminating a display panel which is used for reproduction of colours of photographs

3.2.24
single-flash backlight unit
backlight unit that flashes periodically and is synchronized with the display panel for the purpose of inserting black or grey frame in order to enhance the moving image quality on the display

3.2.25
multi-flash backlight unit
spatially and linearly segmented backlight unit for scanning or field-sequential colour display that flashes periodically and is synchronized with the display for the purpose of inserting colour fields, black or grey fields in order to enhance the image quality on the display or spatially mix the colours for displaying coloured images

3.2.26
multi-primary colours backlight unit
backlight unit that employs multiple LED or laser light sources which have different peak wavelengths

3.2.27
tandem backlight unit
backlight unit that is an integration of multiple distinct and overlapped edge-lit backlight units

3.2.28
spectral power distribution
power per unit area per unit wavelength of a backlight unit, or a bound of light spectral distribution with a power per wavelength, $S(\lambda)$, that emerges from a unit area on the backlight and is measured using a spectrometer or an optical spectrum analyser

Note 1 to entry: For an example, see Figure A.4.

3.2.29
chromaticity
chromaticity coordinates (see IEC 60050-845:1987, 845-03-33) based on CIE 1931 standard colorimetric system (see IEC 60050-845:1987, 845-03-28), x, y, z on a backlight unit are obtained using the tristimulus values, X, Y, Z that is the result of measurement of spectral power distribution, $S(\lambda)$ (see 3.2.28)

Note 1 to entry:

$$X = K_m \int_{\Delta\lambda} S(\lambda)\bar{x}(\lambda)d\lambda, \quad Y = K_m \int_{\Delta\lambda} S(\lambda)\bar{y}(\lambda)d\lambda, \quad Z = K_m \int_{\Delta\lambda} S(\lambda)\bar{z}(\lambda)d\lambda$$

$$x = \frac{X}{X+Y+Z}, \quad y = \frac{Y}{X+Y+Z}, \quad z = \frac{Z}{X+Y+Z}, \quad x+y+z=1$$

where

K_m	is given as K_m = 683 lm/W;
λ	is in the range of 360 nm to 830 nm (definition), or 380 nm to 780 nm (actually);
$\bar{x}(\lambda)$, $\bar{y}(\lambda)$, $\bar{z}(\lambda)$	are the colour-matching functions

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3.3 Terms related to passive optical components

3.3.1
light-guide plate
LGP
transparent media that is used generally in an edge-lit backlight unit for forming the required light distribution spatially for transmissive or transflective display panels

3.3.2
functional light-guide plate
transparent media characterized with optical micro or nano-structures for shaping spatially or angularly the required light for a transmissive or transflective display panel

3.3.3
slab light-guide plate
light-guide plate that has a slab geometrical shape

3.3.4
wedge light-guide plate
light-guide plate with a wedge shape introducing the light from the thicker side

3.3.5
inverted wedge light-guide plate
light-guide plate with a wedge shape introducing the light from thinner side

3.3.6
double-side functional light-guide plate
light-guide plate that is structured with micro- or nano-structure on the back and front surfaces for light shaping

3.3.7
single-side functional light-guide plate
light-guide plate that is structured with micro-reflector or micro-deflector array on back or front surface for shaping and extracting the propagating light

3.3.8
diffusing light-guide plate
light-guide plate that is structured with diffusing micro-structures on the back/front of light shaping guide or that is filled with diffusing materials such as beads in its resin

3.3.9
reflective light-guide plate
light-guide plate that is structured with optical micro-reflectors on the back surface for extracting light from the front surface

3.3.10
deflective light-guide plate
light-guide plate that is structured with optical micro-deflective elements on the front surface for the purpose of deflecting the emergent light rays from the front surface of the light guide plate

3.3.11
dispersive light-guide plate
light-guide plate that is structured with micro-optical elements for dispersing the emergent light on the light-guide plate

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3.3.12
polarizing light-guide plate
light-guide plate with micro- or nano-structures for generating polarized light on it

3.3.13
diffuser film
optical film that functions as light diffusing components in the backlight structure

3.3.14
prism film
optical film that possesses triangular prismatic structures of discrete lines or continuous lines for collimating or deflecting the rays that are incident on its back surfaces

3.3.15
circular prism film
film that possesses triangular prismatic structure and geometrically circular for collimating and deflecting azimuthally incident light rays

3.3.16
luminance enhancement film
brightness enhancement film
light collimating film in which the collimated light results in luminance enhancement

3.3.17
inverted prism film
optical film with triangular prismatic structure whose prisms' tips are directed toward the LGP in backlight structure

3.3.18
total-internal-reflection film
TIR film
optical film (such as inverted prism film) that has a light ray deflecting function based on the total internal reflection

3.3.19
reflector film
film for reflecting back the light that emerges from LGP besides the front surface

3.3.20
light collimating film
optical film that collimates the incident light on its back

3.3.21
micro-deflector element
optical micro-structure with light ray deflection function structured on functional light guide plate

3.3.22
micro-reflector element
optical micro-reflector structure with ray reflection function structured on the functional light-guide plate

3.3.23
micro-diffusive element
optical micro-diffusive structure with ray dispersing function structured on a light-guide plate

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3.3.24
specular light reflector
specular reflective film coated with metal (such as silver, aluminium), or coated with multiple optical layers for reflecting incident light

3.3.25
partially specular light reflector
specular reflective film with partially diffusive characteristic

3.3.26
diffusive light reflector
optical film that diffuses the incident light and generates a homogeneous or non-homogeneous light distribution

3.3.27
light-source reflector
lamp reflector
piece of metal or paper with highly reflective surface that is used for inserting/introducing/re-reflecting light that travels in other directions than toward light control media in a backlight

3.3.28
light-guide reflector
piece of metal or paper with highly reflective surface that is used on the rear of a light-guide plate for reflecting back the light emerged from the back surface or side surfaces of the light guide

3.3.29
light cone
solid angle into which the light radiates from the front surface of a backlight or light-guide plate

3.3.30
block
segment of a backlight which is divided two-dimensionally for synchronization with display panel for the purpose of local dimming

3.3.31
partition
piece of metal or coated paper for optically isolating the segments of one or two-dimensionally divided backlight

3.3.32
addressed block
segment of spatially divided backlight for local dimming that cooperates with the locally addressed display for improving image quality

3.3.33
flashed block
segment of spatially divided backlight that flashes in response to written data of local segment of display panel

3.3.34
backlight cavity
light controlling cavity surrounded by optically structured sheets for directing light toward rear of a display panel

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3.3.35
light chamber
box whose inner side is optically characterized for light shaping and extracting to be used in direct view type backlight

3.3.36
bezel
shaped metal frame for mechanically fixing the display panel and backlight together

3.3.37
case
outer cover of the backlight unit

3.3.38
frame
shaped metal or plastic that is designed to hold the LC panel with the backlight

3.3.39
flexible printed circuit
FPC
piece of flexible material like polyimide that has a printed circuit for driving electrically the light sources and complementary electrical devices in a backlight

3.3.40
metal core printed circuit board
MCPCB
solid metal board on which an electrical circuit has been printed for mounting solid state light sources for using as heat sink in the backlight structure

3.4 Terms related to light sources

3.4.1 Light Emitting Diode (LED)

3.4.1.1
pseudo-white LED
solid state light source that has a LED chip emitting blue light and yellow phosphor for converting a part of the blue light into yellow for generating white light based on complementary colour mixing

3.4.1.2
RGB LED
combination of three primaries of solid state quasi-monochromatic light sources or a set of LED chips with quasi-monochromatic light that are packed together to mix and obtain a white LED at a predefined point

3.4.1.3
ultra-violet stimulated white LED
UV-white LED
white solid state light source with a LED chip emitting in the wavelength range of ultra violet that stimulates a combination of blue, green and red phosphors

3.4.1.4
near UV stimulated white LED
NUV-white LED
white solid state light source with a LED chip emitting in the wavelength range of near ultra violet (e.g. 380 nm to 410 nm) and a combination of blue, green and red phosphors that are stimulated by the chip

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3.4.1.5
RG-white LED
white solid state light source with a LED chip emitting blue light that stimulates red (R) and green (G) phosphors which are added into the cavity of the LED package

3.4.1.6
quasi-monochromatic LED
LED die emitting light at a dominant wavelength and possessing a bandwidth

3.4.2 LED light bar

3.4.2.1
LED light bar
strip light source in which multiple LEDs are mounted along the strip direction to have linearly uniform envelop distribution of luminous intensity for edge-lit backlight applications

3.4.2.2
side-view light bar
light bar that employs LEDs with side-fired radiation pattern

3.4.2.3
top-view light bar
light bar that employs LEDs with top-fired radiation pattern

3.4.2.4
bulk-coupling light bar
light bar that employs omni-directional LEDs in which the LEDs are coupled inside the body of the LGP

3.4.2.5
omni-directional light bar
light bar that employs LEDs with omni-directional radiation pattern

3.4.2.6
colour uniformity light bar
light bar that has a unique chromaticity

3.4.2.7
light bar tolerance
predefined tolerance in the luminous intensity of the light bar at a distance from the bar

3.4.2.8
light bar's spatial distribution
spatial distribution that exists on the light bar or a pre-defined direction at a distant from the light bar

3.4.2.9
light bar's angular distribution
angular luminous distribution that exists around the bar in a pre-defined direction at an angle in polar system

3.5 Terms related to light source drivers

3.5.1
DC-DC converter
electrical circuit board for converting DC voltage to DC voltage required for driving light sources

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